

The Examiner states that the steps of mixing and tumbling composition or mixture of mulch product are notoriously well known in the mulching industry. In addition, using known equipment such as a pin mixer, pan pelletizer, drum granulator, etc. to perform these two steps is obvious depending on the user's preference to make a mulch product for his/her intended use. Applicant has not developed a new process of mulch making because as shown, all references have taught the process or method claimed. Spittle also teaches agitation forces, col. 3, line 21, which are similar to applicants.

In response to the Examiner's arguments applicant submits the declaration of Lee Hoffman. Mr. Hoffman has 26 years of experience in the field of agglomeration with Feeco International. (Hoffman Declaration Paragraph 1). Mr. Hoffman has reviewed the present application and the Spittle patent. (Hoffman Declaration Paragraphs 2 and 3). Mr. Hoffman states that in the world of agglomeration (particle size enlargement), there are four distinctively different types of processes: agitation, pressure, liquid and thermal. (Hoffman Declaration Paragraph 4). The process of the present invention is classified as agitation, while the process disclosed and taught by Spittle requires pressure agglomeration. (Hoffman Declaration Paragraph 5).

Agitation is defined as agglomeration by tumbling (growth). Particles are adhered together by use of balling drums, pans, cones and mixers via impact and tumbling. The resultant shape is a sphere. (Hoffman Declaration Paragraph 6).

Pressure agglomeration utilizes methods such as extrusion presses, pelleting machines (pelletized), piston presses (tableting), and roller presses (briquetting, compacting). The pellets are formed by pressure imparted upon the materials. The

resultant shape is a cylinder for products made with pelleting machines and extrusion presses. (Hoffman Declaration Paragraph 7).

The Spittle process as defined is a multi-step process. The materials are combined, pelletized and then flaked. The Spittle process, though not entirely outlined in the referenced patent, requires the use of some form of pressure equipment to form the pellets. In order to form a flake from a pellet, the pellet must be sheared to form thin flakes with ancillary equipment. In contrast, the mulch agglomeration process of the present invention is a single step tumble process that utilizes a high speed mixer, not pressure, to form granules. (Hoffman Declaration Paragraph 10). The process described in the Spittle patent from Column 3 lines 6-30 is a pressure agglomeration technique. (Hoffman Declaration Paragraph 11).

Spittle discloses mulch flakes made from finely divided paper and/or wood and a surfactant. The flakes also contain a fertilizer. The flakes may include a surfactant, and a typical turf grass NPK type fertilizer. The process described by Spittle includes: shredding waste papers and processing them through a hammer mill. The resulting paper pieces are then introduced into a finish hammer mill. Also added to the finish hammer mill is the appropriate amount of sawdust. The paper is pieces about  $\frac{1}{4}$  to  $\frac{3}{4}$  inch in length and the sawdust sized to pass through a 20-mesh screen. The mixture exiting the finish hammer mill has added to it the correct amount of marker dye, liquid surfactant and water absorbing polymer, if desired. Granular fertilizer is then added if desired. The entire mixture is then processed through a conditioner, in which the correct amount of moisture is sprayed into the mixture as a fine mist as the product is agitated. The mixture is then pelletized into pellets of  $\frac{3}{16}$ -inch diameter, with a length of about 1-1  $\frac{1}{4}$  inches.

The product is then cooled, to harden and dry the outside skin, to prevent mold growth, and keep the pellets from breaking apart. The pellets are then granulated into flakes. The mulch flakes produced during this process are 1/16 to 3/8 inches in the longest dimension and are up to 1/8 inch thick at most. This process described above is a pressure agglomeration process which is distinctively different then the process described in the present invention. (Hoffman Declaration Paragraphs 4, 5, 6, 7, 10 and 11)

The Examiner states that Thomas teaches mulch and process of making the same in which he employs a drum granulator, rotating drum, to mix and tumble the ingredients in the composition together, col. 1, lines 30-35. The Examiner states that it would have been obvious to employ a drum granulator, rotating drum, as taught by Thomas to mix the ingredients in the mulch of Spittle to assure uniform blend of the ingredient in the mulch. Thomas doesn't indicate that the rotating drum is a pin mixer. However, it would have been an obvious substitution of functional equivalent to substitute the rotating drum of Spittle as modified by Thomas with a pin mixer as claimed, since it would perform the same function recited, i.e. to perform the steps of mixing and tumbling ingredients in a mulch so as to produce a uniform mulch composition.

Thomas relates to a mulch having finely divided fibers of paper coating with a wetting agent and preferably dyed green. To produce the mulch, finely divided fibers of paper are coated with a mixture of a solvent or carrier such as water, a wetting agent, and a dye. The finely divided fibers of paper are contacted with the mixture such as by tumbling the fibers of paper while spraying the mixture into the drum. Preferably the wetting agent is mixed with a liquid or solvent such as water and contacted with the

fibers of paper by spraying the liquid mixture into a rotating drum in which the fibers of paper are tumbled.

Finely divided fibers of paper for producing mulch can be made by reducing or fiberizing used newsprint and waste paper in a hammermill. The fibers of paper are produced by running waste paper through three stages of hammermilling. The finely divided fibers of used newsprint and/or wastepaper are coated or contacted with a wetting agent so that the fibers of the resulting paper mulch can be mixed with and suspended in water to provide a mixture which can be applied onto soil by a jet stream of the mixture depositing a layer of mulch on the soil.

The finely divided fibers of paper can be contacted and coated with the wetting agent and dye by spraying a liquid mixture of wetting agent, dye and a liquid carrier or solvent such as water into a blending device such as a rotating drum in which finely divided fibers of paper are being tumbled.

As stated in the Hoffman Declaration, there are four very distinct type of agglomeration, which use very specific types of equipment. Therefore it would not be obvious to use the equipment described in Thomas to modify the method of Spittle. (Hoffman Declaration Paragraphs 4, 6 and 7).

The Examiner states that Morgan teaches a mulch making method in which a binding agent is employed in the mulch mix to hold other elements, such as paper fibers and granules, in the mix together. The Examiner states it would have been obvious to use a binding agent as taught by Morgan in the mulch mix of Spittle to hold elements in the mix together.

Morgan relates to a biodegradable mulch mat comprising an air and water permeable, light impermeable, open celled composite of granules and fibers in a binder matrix prepared from a foam precursor. Biodegradable fibers include cellulosic fibers such as shredded wood, straw, paper, corn stalks, cotton fiber and mosses, protein fibers, and synthetic polymer fibers. Granules include milled hard vegetation. Useful binders include polysaccharides, glycosides, vegetable gums, vinyl polymers, waxes and cross-linkable oils. Slurries of fibers, granules, binder and surfactant are gas entrained, e.g., by whipping, to provide a foam, which is applied to soil around seedlings, the foams dry to a durable, biodegradable mulch mat.

Spittle uses a pressure agglomeration process. There is nothing taught or disclosed in Spittle which states a binding agent as taught in Morgan would be obvious to add. Further there is no reason that a binding agent would be even useful to the mulch of Spittle since Spittle uses pressure to form and keep the mulch together.

Regarding claim 5, the Examiner states that Spittle as modified by Thomas and Morgan are silent about employing a pin mixer having a double helix arrangement. The Examiner states it would have been an obvious matter of choice to one of skill to use any type of pin mixer such as one with a double helix pin arrangement to mix the mulch of Spittle as modified by Thomas and Morgan, depending on cost and how well one wishes to blend the mulch mixture together for his/her intended use.

As stated by Hoffman, the agglomeration processes are distinctively different types of processes which use different types of equipment. Therefore, the use of a pin mixer having a double helix arrangement to mix the mulch is not an obvious matter of choice. (Hoffman Declaration Paragraphs 4-7). Since Spittle teaches pressure

agglomeration, a pin mixer and more specifically one having a double helix arrangement would not be used, nor would it be obvious.

Regarding claim 6, the Examiner states that Spittle as modified by Thomas and Morgan further disclose the paper fibers comprises a by product of a paper making process, col. 3 lines 6-14.

For the reasons stated above, Spittle as modified by Thomas and Morgan does not disclose or make obvious claim 6. Nowhere does Spittle at Col. 3 lines 6-14 paper fibers comprised of a by product of a papermaking process.

Regarding claim 8, the Examiner states that Spittle as modified by Thomas and Morgan discloses a granulated mulch product made by mixing and tumbling operation.

Mr. Hoffman states that in the world of agglomeration (particle size enlargement), there are four distinctively different types of processes: agitation, pressure, liquid and thermal. (Hoffman Declaration Paragraph 4). The process of the present invention is classified as agitation, while the process disclosed and taught by Spittle requires pressure agglomeration. (Hoffman Declaration Paragraph 5).

Agitation is defined as agglomeration by tumbling (growth). Particles are adhered together by use of balling drums, pans, cones and mixers via impact and tumbling. The resultant shape is a sphere. (Hoffman Declaration Paragraph 6).

Pressure agglomeration utilizes methods such as extrusion presses, pelleting machines (pelletized), piston presses (tableting), and roller presses (briquetting, compacting). The pellets are formed by pressure imparted upon the materials. The resultant shape is a cylinder for products made with pelleting machines and extrusion presses. (Hoffman Declaration Paragraph 7).

The Spittle process as defined is a multi-step process. The materials are combined, pelletized and then flaked. The Spittle process, though not entirely outlined in the referenced patent, requires the use of some form of pressure equipment to form the pellets. In order to form a flake from a pellet, the pellet must be sheared to form thin flakes with ancillary equipment. In contrast, the mulch agglomeration process of the present invention is a single step tumble process that utilizes a high speed mixer, not pressure, to form granules. (Hoffman Declaration Paragraph 10). The process described in the Spittle patent from Column 3 lines 6-30 is a pressure agglomeration technique. (Hoffman Declaration Paragraph 11). Therefore, Claim 8 is not obvious over Spittle as modified by Thomas and Morgan.

Regarding claim 9, the Examiner states that Spittle as modified by Thomas and Morgan further discloses the step of performing a size reduction operation on the paper fibers prior to adding the fibers to the mixer, col. 3, lines 6-15.

For the reasons stated above, Spittle as modified by Thomas and Morgan does not disclose or make obvious claim 9.

The Examiner has rejected claim 2 as being obvious over Spittle as modified by Thomas and Morgan and further in view of Moore, 5,266,097. Spittle as modified by Thomas and Morgan is silent about employing a pan pelletizer in place of the pin mixer. Moore teaches a fertilizer method and composition which he mixes the ingredients in the composition in a pan mixer until the composition formed into spherical granules, example 1. The Examiner states it would have been an obvious matter of choice to employ any type of known mixer such as a pan mixer to make pellets/granules as taught by Moore to

mix the mulch of Spittle as modified by Thomas and Morgan, depending on cost factor and how well one wishes to blend the mulch mixture together for his/her intended use.

Moore teaches a method of preparing an aminoureaformaldehyde fertilizer composition. The method is most effectively performed batch wise in a high intensity mixer/reactor/granulator comprising a cylindrical pan rotating around a near vertical axis and containing a small diameter mixer rotating at a high speed relative to that of the pan. In the method, commingling must be continued throughout the method and the aqueous reactants must be heated to a temperature between 60-120° C to initiate the acid catalyzed polymerization.

To prepare the polymers in the form of granules, the acid catalyzed polymerization is performed in a rotating inclined pan which carries the polymers toward a stationary scraper/deflector which deflects the polymer toward a high speed rotor which provides a strong sheer force and homogenization to the polymer and fertilizer enhancing solids. The initially viscous liquid polymer and contained solids are repeatedly passed through the rotor and the polymer and solids are rolled along the walls of the rotating inclined pan as the acid catalyzed polymerization continues until the ammonia is reacted with the urea and formaldehyde and a fluid matrix of water insoluble aminoureaformaldehyde polymer is formed into semi-spherical granules.

Mr. Hoffman states that in the world of agglomeration (particle size enlargement), there are four distinctively different types of processes: agitation, pressure, liquid and thermal. (Hoffman Declaration Paragraph 4). The process of the present invention is classified as agitation, while the process discloses and taught by Spittle requires pressure agglomeration. (Hoffman Declaration Paragraph 5).



Agitation is defined as agglomeration by tumbling (growth). Particles are adhered together by use of balling drums, pans, cones and mixers via impact and tumbling. The resultant shape is a sphere. (Hoffman Declaration Paragraph 6).

Pressure agglomeration utilizes methods such as extrusion presses, pelleting machines (pelletized), piston presses (tableting), and roller presses (briquetting, compacting). The pellets are formed by pressure imparted upon the materials. The resultant shape is a cylinder for products made with pelleting machines and extrusion presses. (Hoffman Declaration Paragraph 7).

Spittle would not use a pan pelletizer which is used in an agitation process and not for a pressure agglomeration process. As shown by Moore, Moore forms spherical granules which are formed in an agitation process versus cylinder products formed in a pressure agglomeration process of Spittle

The Spittle process as defined is a multi-step process. The materials are combined, pelletized and then flaked. The Spittle process, though not entirely outlined in the referenced patent, requires the use of some form of pressure equipment to form the pellets. In order to form a flake from a pellet, the pellet must be sheared to form thin flakes with ancillary equipment. In contrast, the mulch agglomeration process of the present invention is a single step tumble process that utilizes a high speed mixer, not pressure, to form granules. (Hoffman Declaration Paragraph 10). The process described in the Spittle patent from Column 3 lines 6-30 is a pressure agglomeration technique. (Hoffman Declaration Paragraph 11).

Therefore, Spittle as modified by Thomas and Morgan and further in view of Moore does not make claim 2 obvious.

The Examiner has rejected claim 3 under 35 USC 103 over Spittle as modified by Thomas and Morgan and further in view of Clendinning, 3,901,838. Spittle as modified by Thomas and Morgan is silent about employing a paddle mixer in place of the pin mixer. Clendinning teaches a mulch film method and composition in which they employ a paddle mixer to mix the ingredients in the composition together, col. 13, lines 29-34. The Examiner states that it would have been an obvious matter of choice to employ any type of known mixer such as a paddle mixer as taught by Clendinning to mix the mulch of Spittle as modified by Thomas and Morgan, depending on cost factor and how well one wishes to blend the mulch mixture together for his/her intended use.

Clendinning relates to an environmentally degradable biodegradable blend of a dialkanoyl polymer and an environmentally degradable ethylene polymer. These polymeric blends are capable of being fabricated into consumer type and industrial type plastic products. The shaped articles can be fabricated into mulch film, transplanter containers, disposable containers, shipping boxes and crates, packaging material, and can carriers. The invention provides a novel agricultural mulch from material comprising biodegradable thermoplastic polymer and environmentally degradable ethylene polymer. Suitable equipment for fluxing the novel blends include banberry mixers, screw extruders, two roll or multi roll mills, ribbon or paddle blenders, calenders and the like. The time of blending or fluxing is not narrowly critical. The blending time should be sufficient to obtain a substantially uniform mixture.

Mr. Hoffman states that in the world of agglomeration (particle size enlargement), there are four distinctively different types of processes: agitation, pressure, liquid and thermal. (Hoffman Declaration Paragraph 4). The process of the present invention is

classified as agitation, while the process disclosed and taught by Spittle requires pressure agglomeration. (Hoffman Declaration Paragraph 5).

Agitation is defined as agglomeration by tumbling (growth). Particles are adhered together by use of balling drums, pans, cones and mixers via impact and tumbling. The resultant shape is a sphere. (Hoffman Declaration Paragraph 6).

Pressure agglomeration utilizes methods such as extrusion presses, pelleting machines (pelletized), piston presses (tableting), and roller presses (briquetting, compacting). The pellets are formed by pressure imparted upon the materials. The resultant shape is a cylinder for products made with pelleting machines and extrusion presses. (Hoffman Declaration Paragraph 7).

Spittle would not use a paddle mixer which is used in an agitation process and not for a pressure agglomeration process.

Therefore, Spittle as modified by Thomas and Morgan and further in view of Clendinning does not make claim 3 obvious.

The Examiner has rejected claim 7 under 35 USC 103 as being obvious over Spittle as modified by Thomas and Morgan and further in view of Decker, 5,806,445. Spittle as modified by Thomas and Morgan are silent about using sewer sludge in place of paper fibers. Decker teaches in col. 2, lines 10-13, that sewage sludge is proven to be a very effective mulch media because it is plentiful, inexpensive, easy to handle and rich in nutrients. The Examiner states that it would be obvious to substitute sewage sludge as taught by Decker for the paper fibers of Spittle as modified by Morgan in order to reduce cost and ease of handling and still produce an effective mulch.

Decker relates to a liquid mulch apparatus for the production of thin lightweight and fastly growing sod over an impervious surface such as plastic sheeting. The apparatus includes a transportable agitating tank and a trailing planter assembly. Decker describes sewage sludge as a material to be used to grow grass sod over a root impervious surface. Composted sewage sludge and composted yard waste or the two of them combined have proved to be very effective media; they are both plentiful, inexpensive easy to handle and rich in nutrients.

Seed, springs, stolons, milled turf pieces (sod that has been hammer milled), or combinations of these are mixed in water in a storage container having agitating means (such as FINN hydromulcher) with wood or paper fiber, peat, or other fibrous material that acts as a mulch to form a liquid slurry. Once the slurry has been sprayed and stabilized on the plastic sheeting, it can be covered with suitable growing media, such as sewage sludge.

The present application relates to a composition and method for making a fortified mulch with fertilizers using an agglomeration/granulation process. As stated in the prior art mulches are mixed with water and agitated in a holding tank, and then sprayed onto a seedbed. This is described in Decker.

For the reasons stated above, Spittle as modified by Thomas and Morgan and further in view of Decker do not make claim 7 obvious.

The process of the present invention is taking a moist fiber based product and impregnating it with NPK in a mixer. The NPK can be added before or after entry into the mixer. The mixer performs the work of creating an agglomerated or granulated product that is a homogenous blend of paper product and NPK. This product is then

dried to a desired level of moisture and screened as necessary. A binding agent can be added to the mixer to enhance agglomeration/granulation process. A size reduction process can be performed on the paper fiber product. The mixer described in the specification is pin mixer, pan pelletizer, paddle mixer, drum granulator or other type of mixer. A double helix pin arrangement is preferred. Sewage sludge can be used to create the fortified mulch rather than paper fibers. There is an example in the application, which shows how the pin mixer imparts agitation forces on the material and sprayed liquid binder. That this causes a tumbling, turbulent movement resulting in densification.

Applicant believes that the application is now in condition for allowance.

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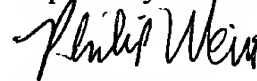
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